Post-Operative Cancer Treatment and Chronic Wound Care Technology Concept Unveiled

Neil Cooper, Team Consulting

Award-winning medical design and development company Team Consulting has today unveiled an innovative concept that has the potential to address two significant unmet clinical needs; early detection of cancer regrowth following surgery and detection of infection within chronic wounds. The new technology, dubbed Spatial Reach, gives clinicians the ability to non-invasively monitor the site of an internal tumor excision or a chronic wound.

Once a site has been analyzed then the same platform can then be used to deliver highly targeted therapy to the precise areas where treatment is required, either to kill remaining cancer cells or to treat wound infections – all without exposing nearby tissue directly to either chemotherapy agents or to unnecessary antibiotics.

Click here to watch a video demonstration of the technology. [1]

This patented technique has the potential to dramatically reduce patient recovery time and increase the survival rate of critically ill patients.

Team Consulting will be unveiling the Spatial Reach concept at AdvaMed 2013 in Washington DC, 23-25 September [2].

How the Technology Works

Utilizing low-cost hollow fiber tubing currently used for hemodialysis, alongside specially engineered hardware and software, Team Consulting's Spatial Reach technique fuses diagnostics and therapy and has the potential to create a whole new category of advanced wound care.

A continuous spiral or zig-zag pattern of the porous hollow fiber tubing is placed into or onto the target area. The tubing is filled with saline and the surgical site can be closed or a dressing can be applied as normal. With the tubing in place any biomarkers of cancer or infection can diffuse into the tube. The presence of cancer regrowth or infection can then be monitored by pumping out and analyzing the column of fluid. When the sample is passed through a handheld reader, healthcare professionals can see not only whether cancer or infection is present but exactly where it is in three dimensions.

Critically, having analyzed the sample, the Spatial Reach platform can then be run 'in reverse' so that chemotherapy or an antibiotic can be delivered to back to just those areas within the wound where it is required. Slugs of chemotherapy or antibiotic are pumped back by the device into the tubing – interspersed with saline – so that the therapy ends up adjacent to the infection or cancer. The drug can then diffuse out of the porous tubing and only treats the targeted region. This allows toxic chemotherapy to be used without causing damage to healthy tissue. It will also allow 'last ditch' antibiotics to be delivered which can treat superbugs such as MRSA yet which are too toxic to be given to vulnerable patients systemically.

Dr. Ben Wicks, Head of Critical Care at Team Consulting, commented: "Using Spatial Reach to directly treat tumors and severe wounds could transform treatment for millions of people. Currently there are very few tools available for healthcare professionals to adequately monitor tumor excision sites and wounds, and most techniques employed today involve significant distress for patients. By contrast our new system enables samples to be taken, and medication to be delivered, without disturbing patients at all which could have a dramatic impact on the efficacy of therapy."

"Spatial Reach is an early-stage concept but it offers significant benefits to surgeons, healthcare professionals and patients. The feedback from industry experts has been very positive and we'll be using AdvaMed in Washington to further talks with industry players," continues Wicks.

Minimizing Infection in Chronic Wound Care

Chronic wound care, especially in elderly patients, is currently a serious problem, costing the NHS around £3bn a year and approximately $25bn in the U.S. Many people are unaware that wounds, particularly for the elderly and those with diabetes, can sometimes take weeks or even months to heal. Currently, diagnostics are rarely used in routine wound management because they don't fit into normal clinical workflow and they're expensive. Spatial Reach was designed to be very low cost and to fit seamlessly into normal clinical practice.

Rob Littlefield, MSc, GlobalData [3]'s analyst covering cardiovascular and wound care devices said "Driven by the ongoing proliferation of diabetes and growing

elderly population suffering from chronic wounds, the rapidly expanding wound care market is expected to reach over $22 billion by 2015, from $17 billion in 2012. While large companies such as Johnson and Johnson Inc., Smith & Nephew plc., ConvaTec and KCI are the major beneficiaries of this ongoing growth, their traditional technologies lack clinical evidence of efficacy and cost-effectiveness, which has given rise to many new players seeking to capitalize on this mounting market opportunity."

Reducing Collateral Damage for Post-Operative Cancer Patients

In the case of post-operative cancer treatment, Team believes that Spatial Reach could be particularly significant for diagnosis and therapy for cancers such as brain tumors. In 2010 there were 9,156 new brain, other CNS and intracranial tumor cases registered in the UK alone.

In any neurosurgical procedure a key requirement is minimizing collateral damage to the patient. However, monitoring tumor regrowth currently involves multiple invasive surgeries to collect samples for testing. The use of powerful medication during traditional treatment can also cause unwanted harm to healthy tissues.

By providing the ability to deliver highly targeted therapy and monitor post-operative regrowth without the need for further surgery, Spatial Reach can reduce the potential for physical and mental distress for patients.

Prof Garth Cruickshank, Professor of Neurosurgery at Birmingham University [4], said: "If proven, this technology could offer for the first time the ability to simply, safely and continuously target delivery of both chemotherapeutic and biological therapies to locoregional areas of the brain. Significantly this would avoid problems of access such as the Blood Brain Barrier and problems of systemic toxicity as in the treatment of bone marrow."

Links:
[1] http://www.mdtmag.com/videos/2013/09/post-operative-cancer-treatment-technology-unveiled
[2] http://advamed2013.com/
[3] http://healthcare.globaldata.com/
[4] http://www.birmingham.ac.uk/staff/profiles/cancer/cruickshank-garth.aspx